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(54) **VERTICAL TRANSISTOR DEVICE STRUCTURE WITH CYLINDRICALLY-SHAPED REGIONS**

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CPC ***H01L 29/407*** (2013.01); ***H01L 29/0696*** (2013.01); ***H01L 29/4238*** (2013.01);
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See application file for complete search history.

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(57) **ABSTRACT**

A vertical power transistor device includes a semiconductor layer of a first conductivity type, with a plurality of cylindrically-shaped dielectric regions disposed in the semiconductor layer. The cylindrically-shaped dielectric regions extend in a vertical direction from a top surface of the semiconductor layer downward. Adjacent ones of the cylindrically-shaped dielectric regions being laterally separated along a common diametrical axis by a narrow region of the semiconductor layer having a first width. Each dielectric region has a cylindrically-shaped, conductive field plate member centrally disposed therein. The cylindrically-shaped, conductive field plate member extends in the vertical direction from the top surface downward to near a
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